Even more than two decades later, Hugo Rossi can still recall the woman standing in his office, crying over math. The then-University of Utah mathematics chairman was teaching a remedial algebra course in the late 1980s and noticed that some of his nontraditional female students who had entered college years after high school were unnecessarily anxious. They were among the best students in the class, but they’d end up in his office, fearing for their grades. They reminded him of his own daughter, who loved math but couldn’t be persuaded, even by him, that she could make a career of it. “I remember very distinctly one woman saying, ‘I know the time is going to come when I won’t be able to do it.’ I asked her, ‘How do you know that?’ Basically, they had been told that by their parents and their teachers: ‘OK, it’s cute you have a little interest in mathematics, but it’s not really for women.’”

After Rossi became dean of the U’s College of Science, he set about overhauling that damaging stereotype. In 1991, he launched the ACCESS Program for Women in Science and Mathematics, which since then has helped hundreds of women enter and succeed in science, technology, engineering, and mathematics fields. Of those who have graduated, 76 percent earned a degree in science or a science-related field, with 15 percent receiving an advanced degree in a science-related field. Data gathered by the program show ACCESS students graduate with a higher grade point average than other College of Science graduates (3.62 versus 3.38 from 2000 to 2010) and have higher graduation rates (70 percent versus 52 percent from 2000 to 2009).

The program now has more than 500 alumnae, and ACCESS graduates have gone on to become professors, doctors, and teachers. One woman is a researcher at NASA’s Jet Propulsion Laboratory and works as the tactical activity planner for the Mars rover Opportunity. “We’ve got superstars all over the country,” says Lisa Batchelder, the ACCESS program’s coordinator.

Pierre V. Sokolsky, dean of the U’s College of Science, was so impressed by the program Rossi created that he doubled its enrollment after he became dean in 2007. It’s now a $150,000 a year program funded with $40,000 from the U and the rest from private contributions, including a large grant from Chevron.

The ACCESS program currently recruits 42 high school graduates—up from 12 in its first year—to spend the summer before their freshman year on campus for a seven-week intensive science program. With help from a scholarship, the students live at the Donna Garff Marriott Honors Residential Scholars Community building and study physics, astronomy, chemistry, mathematics, and biology with top U professors. The students develop a
network of peers and mentors and are introduced to campus life. In addition to the scholarship that covers their summer program and housing, they are given a $2,000 stipend during their freshman year that they can use for expenses.

“It makes all the difference in the world to have someone who they feel is on their side,” says Rosemary Gray, who has been the ACCESS program’s director since 2006. “It really helps with retention. It helps them feel more connected to the University.”

Instead of attending lecture courses during that first summer, the students work on research experiments and spend time “getting their hands dirty,” Sokolsky says. “There’s a lot of dry things that [science majors] have to do. That’s not what [science] is about. That’s learning the language. Sometimes I tell my students, ‘Why are you learning French? Because you want to learn French or you want to spend time in Paris?’ A lot of students get stuck because they don’t see that it leads to a trip to Paris,” he says. “The earlier you can get them to see what it’s really about, the more motivated they’ll be to get through the hard parts.”

During their freshman spring semester, ACCESS students also work as assistants in research labs and present their findings at a symposium, an experience most students don’t get a chance to do until they are juniors. And though the ACCESS program’s formal activities finish at the end of the students’ freshman year, most students continue their connections with one another during their subsequent years at the U.

Rossi says the U program was inspired by the Emerging Scholars Program developed by Philip Uri Treisman at the University of California, Berkeley. While a graduate student, Treisman—an eventual MacArthur Fellow and now director of the Charles A. Dana Center at the University of Texas at Austin, which works on helping underserved students succeed in college—saw that minority students weren’t doing well in freshman calculus even though they excelled in high school. His study of the reasons why led him to conclude it was because they were isolated on campus, not because they weren’t motivated or smart enough. He developed a program that helped students connect with fellow students and professors through an honors mathematics course, as well as with the campus at large.

The University of Utah program Rossi developed from that model is now well known, and about 100 applicants each year compete for the 42 slots. The selected women have an average GPA of 3.97. But in 1991, the students were largely recruited by Rossi and others involved in creating ACCESS, he says.

Stacy Firth BS’95 MS’98 was in the inaugural ACCESS class, which she joined after her junior year in high school. She had already taken Advanced Placement calculus that year and was persuaded by Rossi to try the U’s summer program. She made good friends and loved campus life. While Firth knew she liked math and science, “ACCESS was pivotal in solidifying that interest. I could have been dissuaded if I had been plopped into a massive freshman/sophomore-level course where there are tons of students and not had the connections I made through ACCESS.”
She went on to graduate with a bachelor’s degree in chemical engineering, and she recalls three other ACCESS students attended the U with her in that field. “There was a really good cohort of us going together and feeling like, ‘We’re not foreigners here,’” she says. “For any student, if they feel like they’re by themselves and nobody has their back, it’s really hard to go into more challenging fields.”

She believes that had she not had peers and professors from ACCESS to rely on when she struggled, she might have wrongly believed she wasn’t capable of the work and changed majors, instead of realizing she could rise to the challenge. Firth went on to receive master’s and doctoral degrees (the latter at UT Austin) in chemical engineering. Today, she teaches a survey of engineering class at Olympus High School in Holladay, Utah, that she helped design as an associate instructor in the U’s College of Engineering. The course, for high-school freshmen or sophomores, introduces them to the field of engineering by tackling real-world engineering problems at the school or in the city and conducting fun experiments such as building a spectrometer and bioreactor to create biodiesel.

Firth’s female students clearly have a role model and encouragement to pursue math and science. Yet just three girls are enrolled among the 41 high-school students in Firth’s current engineering courses. That’s why Firth believes the U’s ACCESS program is still necessary.

Sokolsky agrees that the situation at Olympus isn’t unique. “It’s getting better, but talk to these young women. There’s a lot of pressure to be a homemaker or to go into business or do other things that are typical of women,” he says. “Science is about talent. It’s about discovery. We need all the brains we can get.”
can get. Ignoring half the world simply doesn't make any sense.”

The percentage of women obtaining bachelor's degrees at the U from the colleges of engineering and science has grown since the program's creation in 1991, but women are still outnumbered. The number of female engineering graduates has stayed flat, at 9 percent. The number of women graduating with bachelor's degrees in the sciences, meanwhile, has grown from 23 percent to 34 percent, but only in the field of biology does the proportion of females begin to approach the number of males, with about 46 percent of graduates being female.

Nationally, male high school students are more than twice as likely as female students to be interested in science, technology, engineering, and math fields. By 2016, 45 percent of high school boys are forecast to enter those fields, compared with less than 15 percent of girls, according to a report by the college planning service My College Options and the resource site Stemconnector.

While the number of women earning bachelor's degrees nationally in science and math fields has grown dramatically since the 1960s, men still outnumber women, except in biological and agricultural sciences and chemistry, according to the American Association of University Women. When it comes to engineering, physics, and computer science, women obtain just 20 percent of the degrees. The gap persists and is more dramatic in the workforce, the association says.

Sokolsky believes that ideally, every freshman should have a chance to enroll in a program like ACCESS, to transition them from high school to college. For now, the U has also created an ACCESS-like program for refugees and minorities, called Refuges, which includes a summer science bridge course. And each department has its own way of trying to keep students engaged, including the Curie Club in the Department of Chemistry, which was recently created to inspire women to become scientists and to help women scientists balance family and work life.

Sokolsky also thinks the U should hire more female professors to provide role models to students. The College of Science currently has 25 female professors and instructors out of its total of 156 faculty members, up from one female faculty member in 1990. He says the tenure process needs to take into account the balance of work and home life, and he imagines a time when faculty members could temporarily take part-time appoint-

ments but still be taken seriously. "If we're going to be successful in integrating women in a real way, we have to come to grips with the fact that life is not just writing papers and research," he says. "You have to change the attitude that you're not serious if you care about your family."

Current students in the U’s ACCESS program say resistance to women in science and math is subtle when it surfaces. Sophomore Sara Fauver says she felt like she had to prove herself more than boys did in her AP calculus and biology classes at Utah’s West Jordan High School. Karlee Stokes says she was one of few girls in upper-level science classes at Morgan High in northern Utah, and she was the only girl who competed in her region to be a science Sterling Scholar. "I had a lot of people who told me I wouldn't ever win," the U freshman recalls. She ended up beating those so-called "genius boys" in the regional contest.

Seeing friendly, female faces in college classes can make a difference, students in the U ACCESS program say. Fauver knows of girlfriends in physics and engineering at the U who changed majors because there were few women in their classes. She believes the ACCESS program gave her an edge. In addition to the peer support and the professors' mentoring, her freshman research lab experience led her to join two other undergraduate research programs. "I'm really grateful for all the doors this has opened," she says.

Stokes recollects that in an introductory biology class of 200 students, she sat by ACCESS friends every day. "To already know them going into the class, to have someone to study with, that was why I did so well in the class." Stokes, a biology major, credits the program with helping her toward greater success. "It changed my life," she says. "Without it, I would still be in science. But with it, I'm excelling more than I ever would have. We've had so many opportunities that we wouldn't [otherwise] have had." ✪

"—Heather May is a former Salt Lake Tribune reporter who now works as a Salt Lake City-based freelance writer.

Visit continuum.utah.edu to watch a video about how the ACCESS program helped a student who is now in medical school.